

Emerging Drugs of Abuse

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21 USC § 812 – Schedules of controlled substances

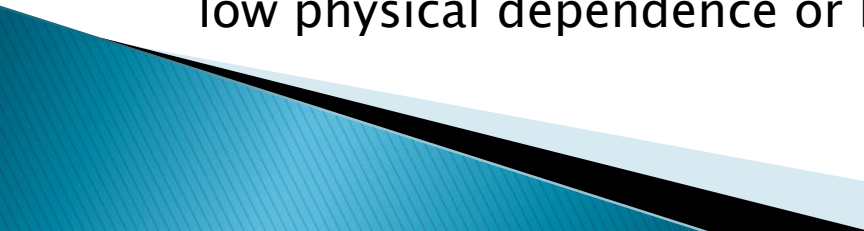
- ▶ Except where control is required by United States obligations under an international treaty, convention, or protocol, in effect on October 27, 1970. The findings required for each of the schedules are as follows:
- ▶ **Schedule I**
 - (A) The drug or other substance has a high potential for abuse.
 - (B) The drug or other substance has no currently accepted medical use in treatment in the United States.
 - (C) There is a lack of accepted safety for use of the drug or other substance under medical supervision.

21 USC § 812 – Schedules of controlled substances

▶ Schedule II

- (A) The drug or other substance has a high potential for abuse.
- (B) The drug or other substance has a currently accepted medical use in treatment in the United States or a currently accepted medical use with severe restrictions.
- (C) Abuse of the drug or other substances may lead to severe psychological or physical dependence.

▶ Schedule III

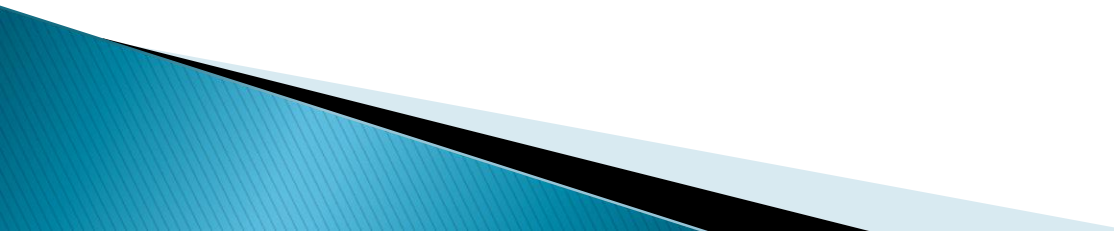
- (A) The drug or other substance has a potential for abuse less than the drugs or other substances in schedules I and II.
 - (B) The drug or other substance has a currently accepted medical use in treatment in the United States.
 - (C) Abuse of the drug or other substance may lead to moderate or low physical dependence or high psychological dependence.
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21 USC § 812 – Schedules of controlled substances

▶ Schedule IV

- (A) The drug or other substance has a low potential for abuse relative to the drugs or other substances in schedule III.
- (B) The drug or other substance has a currently accepted medical use in treatment in the United States.
- (C) Abuse of the drug or other substance may lead to limited physical dependence or psychological dependence relative to the drugs or other substances in schedule III.

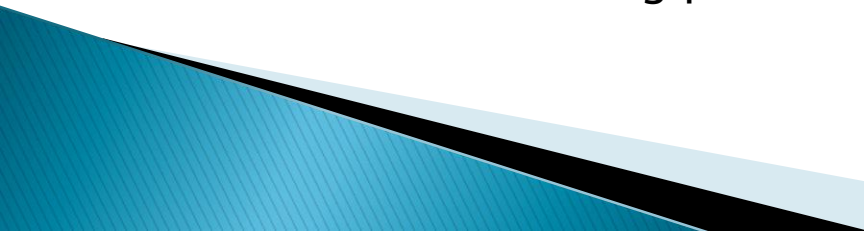
▶ Schedule V

- (A) The drug or other substance has a low potential for abuse relative to the drugs or other substances in schedule IV.
 - (B) The drug or other substance has a currently accepted medical use in treatment in the United States.
 - (C) Abuse of the drug or other substance may lead to limited physical dependence or psychological dependence relative to the drugs or other substances in schedule IV.
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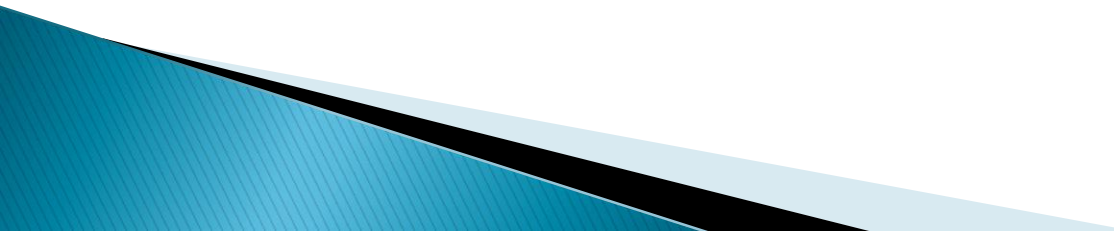
Schedule Questionnaire: Test Your Skills

- ▶ **Opium** natural, semi-synthetic, and synthetic opiates – What Schedule?
 - **Depends:** Heroin, Desomorphine (infamous due to “Krokodil”) – **(Schedule I)**, Dilaudid, Fentanyl, Oxycontin, Percoset, Roxycotin, and Methadone – **(Schedule II)**, Codeine, Vicodin, Buprenorphine, and Low Dosages of Morphine – **(Schedule III)**, and lowest dosages of codeine, opium and other low dosages of opiate agonists – **(Schedule V)**
- ▶ **Cocaine** – What Schedule? **Amphetamines and Methamphetamines** – Schedule?
 - Cocaine – **(Schedule II)**
 - Amphetamines and Methamphetamines **(Schedule II)**
- ▶ **Marijuana** – What Schedule?
 - Marihuana (as the government likes to call it) – **(Schedule I)** The government does not recognize medical marijuana.
- ▶ **Hallucinogens** – What Schedule?
 - **Depends:** Most hallucinogens (LSD [Lysergic Acid Diethylamide], Psilocybin, Peyote, Bromo DragonFly, etc.) – **(Schedule I)**, Lysergic Acid (precursor to LSD but technically not an hallucinogen) and Dronabinol (Marinol – Medical Marijuana) – **(Schedule III)**.

History of Emerging Drug Prohibition

- ▶ **Alcohol** – In the 1700's and 1800's, some states initiated efforts to control alcohol use, specifically to restrict use by Native Americans.
 - ▶ Alcohol prohibition (1920's) was in part a response to the drinking practices of poor European immigrants, who became the new lower class.
 - ▶ Prohibition represented a conflict between urban and rural values emerging in the United States. Given the mass influx of immigrants to the urban dwellings of the United States, many individuals within the prohibition movement associated the crime and morally corrupt behavior of the cities of America with their large immigrant populations.
 - ▶ In a backlash to the new emerging realities of the American demographic, many prohibitionists subscribed to the doctrine of "nativism" in which they endorsed the notion that America was made great as a result of its white Anglo-Saxon ancestry.
 - ▶ This fostered xenophobic sentiments towards urban immigrant communities who typically argued in favor of abolishing prohibition. Additionally, these nativist sentiments were a part of a larger process of Americanization taking place during the same time period.
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History of Emerging Drug Prohibition

- ▶ **Opium** was first restricted in San Francisco California in 1875 when it became associated with Chinese immigrant workers and opium dens.
 - ▶ This was followed by other laws throughout the country, and federal laws which barred Chinese people from trafficking in opium.
 - ▶ Though the laws affected the use and distribution of opium by Chinese immigrants, no action was taken against the producers of such products as laudanum (and other “elixirs”), an extract of opium and alcohol, commonly taken as a panacea by white Americans.
 - ▶ The Harrison Tax Act in 1914 proceeded to first tax and “track” the use of both opiates and cocaine.
 - ▶ Due to this Act, it became legal precedent that any prescription for a narcotic given by a physician or pharmacist – even in the course of medical treatment for addiction – constituted conspiracy to violate the Harrison Act, and thus the temporary criminalization of any opiates, even for medical reasons.
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History of Emerging Drug Prohibition

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- ▶ **Heroin** was first synthesized in London 1873. It was independently synthesized 23 years later by a Bayer. From 1898 – 1910 Bayer marketed Heroin as a non-addictive morphine substitute and cough suppressant.
- ▶ Bayer marketed the drug as a cure for morphine addiction before it was discovered that it rapidly metabolizes into morphine.
- ▶ As such, diacetylmorphine (heroin) is essentially a quicker acting form of morphine. The company was embarrassed by the new finding, which became a historic blunder for Bayer



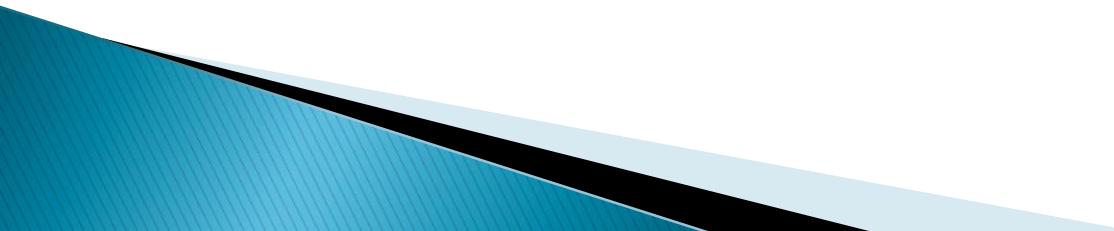
History of Emerging Drug Prohibition

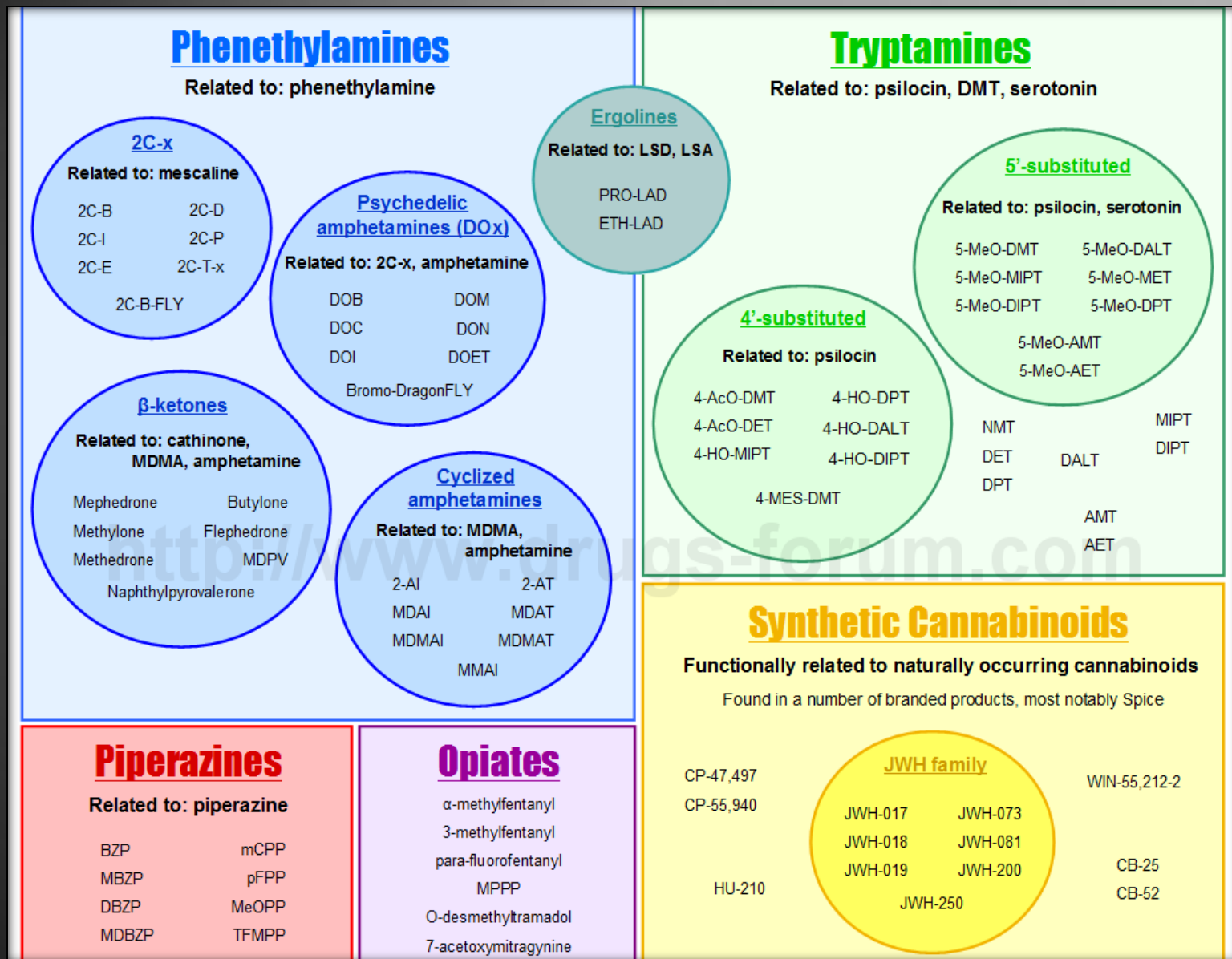
- ▶ **Marijuana** was legal until the 1930s when it became associated with Mexican immigrants.
- ▶ Before the 1930's state by state passed marijuana legislation, which was due to the tensions developed by the influx of Mexican's into these states following, and during, the revolution in Mexico in 1910. Many immigrant Mexican's brought with them marijuana.
- ▶ When Montana outlawed marijuana in 1927, the Butte Montana Standard reported a legislator's comment: "When some beet field peon takes a few traces of this stuff... he thinks he has just been elected president of Mexico, so he starts out to execute all his political enemies." In Texas, a senator said on the floor of the Senate: "All Mexicans are crazy, and this stuff [marijuana] is what makes them crazy."
- ▶ Eastern states are also said to be influence by Jazz musicians use, thus associating African Americans to a lesser extent with prohibition of pot.

History of Emerging Drug Prohibition

- ▶ **Cocaine** became illegal after it became associated with African Americans following Reconstruction.
- ▶ The dangers of cocaine use became part of a moral panic that was tied to the dominant racial and social anxieties of the day.
- ▶ In 1903, the *American Journal of Pharmacy* stressed that most cocaine abusers were "bohemians, gamblers, high- and low-class prostitutes, night porters, bell boys, burglars, racketeers, pimps, and casual laborers."
- ▶ In 1914, Dr. Christopher Koch of Pennsylvania's State Pharmacy Board made the racial innuendo explicit, testifying that, "Most of the attacks upon the white women of the South are the direct result of a cocaine-crazed Negro brain."
- ▶ Mass media manufactured an epidemic of cocaine use among African Americans in the Southern United States to play upon racial prejudices of the era, though there is little evidence that any such an epidemic actually took place.
- ▶ At that time, the 1914 Harrison Tax Act was enacted on cocaine and opium.

History of Emerging Drug Prohibition

- ▶ **LSD**, legal in the 1950s, became illegal in 1968 when it became associated with the counterculture.
 - ▶ Several figures, including Aldous Huxley, Timothy Leary, and Al Hubbard, began to advocate the consumption of LSD. LSD became central to the counterculture of the 1960s.
 - ▶ On October 24, 1968, possession of LSD was made illegal in the United States.
 - ▶ The last FDA approved study of LSD in patients, ended in 1980, while a study in healthy volunteers was made in the late 1980s.
 - ▶ Today, medical research around LSD is resuming around the world.
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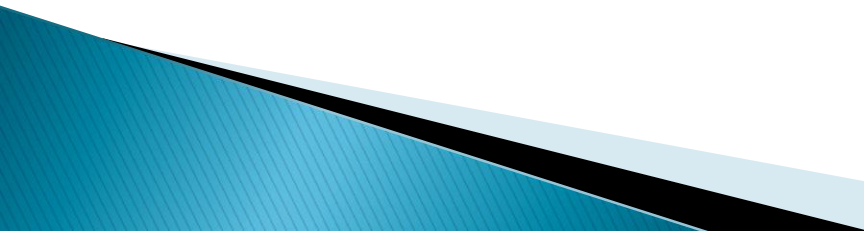
Schematic highlighting the major families and subfamilies of research chemicals, and some of their most prominent members.

3, 4-Methylenedioxypropylone (MDPV) & other Synthetic Cathinones (a.k.a. “Bath Salts”)

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What are Synthetic Cathinones

- ▶ Synthetic cathinones are related to the parent compound cathinone.
 - ▶ Since the mid-2000s, unregulated ring-substituted cathinone derivatives have appeared in the European and American recreational drugs market.
 - ▶ The most commonly available synthetic cathinones sold on the recreational market in the period up to 2011 appear to be 3, 4-Methylenedioxypyrovalerone (MDPV), mephedrone, and methylone.
 - ▶ These products are usually encountered as highly pure white or brown powders. Cathinone derivatives are claimed to have effects similar to those of cocaine, amphetamine or MDMA (ecstasy), but little is known of their detailed pharmacology.
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3, 4- Methylenedioxypropylvalerone – MDPV



What is MDPV (bath salts)

- ▶ The term 'bath salts' refer to commercially available products that have as part of their composition a legal stimulant (synthetic cathinone) called 3, 4-Methylenedioxypyrovalerone, or MDPV.
- ▶ Currently illegal in New Jersey and illegal nationally (3 synthetic cathinones [MDPV, Mephedrone and Methyldone] were placed on temporary emergency ban October 21, 2011 by the DEA). They are sold mostly on the internet, but can also be found in select shops locally. They're known by a variety of names, including "Red Dove," "Blue Silk," "Zoom," "Bloom," "Cloud Nine," "Ocean Snow," "Lunar Wave," "Vanilla Sky," "Ivory Wave," "White Lightning," "Scarface" "Purple Wave," "Blizzard," "Star Dust," "Lovey, Dovey," "Snow Leopard," "Aura," and "Hurricane Charlie." While they have become popular under the guise of selling as 'bath salts', they are sometimes sold as other products such as insect repellent, or plant food with names like "Bonsai Grow" among others.
- ▶ Much like the marketing of Synthetic Cannabinoids (Spice/K2) as incense, MDPV has been market as "bath salts" and just like Spice/K2 MDPV is specifically labeled "not for human consumption."

MDPV's chemical 'cousins'

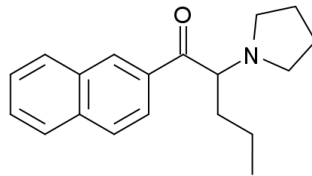
- ▶ There are other drugs with a similar chemical structure to MDPV.
- ▶ These include α -pyrrolidinopropiophenone (α -PPP). Little is known about this compound, but it has been detected by laboratories in Germany as an ingredient in "ecstasy" tablets seized by law enforcement authorities.
- ▶ 4'-methyl- α -pyrrolidinopropiophenone (MPPP) is a stimulant drug. It is very structurally similar to α -PPP. MPPP was sold in Germany as a designer drug in the late 1990s and early 2000s, although it has never achieved the same international popularity as its better-known relations α -PPP and MDPV.
- ▶ 3',4'-methylenedioxy- α -pyrrolidinopropiophenone (MDPPP) is a stimulant designer drug. It was sold in Germany in the late 1990s and early 2000s as an ingredient in imitation ecstasy (MDMA) pills. It shares a similar chemical structure with α -PPP and MDPV.

Mephedrone (similar, but not MDPV)

- ▶ Because of the emerging nature of these drugs, most specifically MDPV to the US marketplace, there seems to be confusion regarding MDPV and other drugs such as Mephedrone (4-MMC) being used in bath salts.
- ▶ **Mephedrone**, also known as **4-methylmethcathinone (4-MMC)**, or **4-methylephedrone**, is a synthetic stimulant drug of the amphetamine and cathinone classes. Slang names include “meph,” “drone,” and “MCAT.”
- ▶ It is reportedly manufactured in China and is chemically similar to the cathinone compounds found in the khat plant of eastern Africa. It comes in the form of tablets or a powder, which users can swallow, snort or inject, producing similar effects to MDMA, amphetamines and cocaine.
- ▶ In July, 2010, the DEA listed Mephedrone a “drug and chemical of concern.”

Gen 2 of “Bath Salts” (Naphyrone)

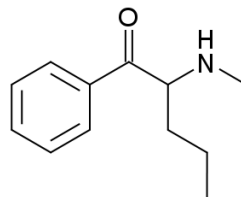
- ▶ Cosmic Blast, marketed as a jewelry cleaner, is a stimulant/hallucinogen that is being marketed in the same way bath salts were. Drug sellers don't seem to care about US drug law in that samples of Cosmic Blast that have been tested in toxicology laboratories have been known to contain MDPV.
- ▶ It can also contain **Naphyrone** (which became popular in the UK after their ban of Mephedrone recently).
- ▶ Naphyrone also known as O-2482 and naphthylpyrovalerone, is a drug derived from pyrovalerone that acts as a triple reuptake inhibitor, producing stimulant effects and has been reported as a novel designer drug. No safety or toxicity data is available on the drug¹



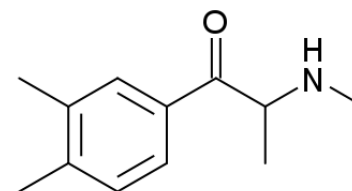
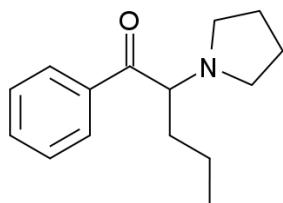
- ▶ Anecdotal reports of Naphyrone are it can stay in your body for long periods and since it is a reuptake inhibitor of Serotonin, which is implicated in body heat regulation, body temperatures can soar upwards of 107–108 degrees.

Gen 3 of “Bath Salts”

- ▶ **Pentedrone**, also known as 2-(methylamino)-1-phenylpentan-1-one or α -methylamino-valerophenone, is a designer drug with presumably stimulant effects, which has been found since 2010 as an ingredient in a number of "bath salt" mixes sold as legal highs.



- ▶ **Alpha-PVP** – α -Pyrrolidinopentiophenone (alpha-Pyrrolidinovalerophenone, α -PVP, O-2387, alpha-PVP) is a stimulant compound developed in the 1960s and related to pyrovalerone. The mechanism of action is unknown for α -pyrrolidinopentiophenone. α -PVP is believed to act similarly to the designer drug MDPV, which acts as a norepinephrine-dopamine reuptake inhibitor (NDRI), although no substantial research on this compound has been conducted.



- ▶ **3,4-DMMC** – 3,4-Dimethylmethcathinone is a stimulant drug first reported in 2010 as a designer drug analogue of mephedrone, apparently produced in response to the banning of mephedrone, following its widespread abuse in many countries in Europe and around the world.

I could just go on and on ... The Laundry List of Substituted Cathinones

Chuck Schumer on July 9, 2012 stated the following [on his website](#): “*President’s Signature Hammers Final Nail in Coffin for Legal Bath Salts*” Oh really? Is that so? I guess we pretend these don’t exist:

[4-MePPP](#)

[MOPPP](#)

FPPP

[MPBP](#)

[Pyrovalerone](#) (O-2371)

[MPHP](#)

[MDPPP](#)

[MDPBP](#)

~~MDPV~~

FPVP

O-2390

O-2494

[Naphyrone](#) (O-2482)

α -PVT

New Title!

Schumer’s Legislation puts 2 nails in a coffin in need of at least 81 more nails!

DMEC

[Methedrone](#)

Ethedrone

3-MOMC

2-FMC

2-FEC

[3-FMC](#)

3-FEC

3-CMC

3-BMC

[Flephedrone](#)

4-FEC

[Brephedrone](#)

FMMC

2,5-DMOMC

[bk-MDA](#)

2,3-MDMC

[Methylone](#)

[Ethylone](#)

BMDP

bk-IMP

4-Fluorobuphedrone

4-Bromobuphedrone

4-MeMABP

4-Me-NEB

4-Methoxybuphedrone

[Butylone](#)

[Eutylone](#)

BMDB

bk-DMBDB

5-Methylmethylone

5-Methylethylone

2-Methylbutylone

5-Methylbutylone

[Pentylone](#)

MMP

MEP

bk-[Methiopropamine](#)

[\$\alpha\$ -Phthalimidopropiophenone](#)

[\$\alpha\$ -PPP](#)

[\$\alpha\$ -PBP](#)

3-MPBP

EPBP

MOPBP

O-2384

[\$\alpha\$ -PVP](#) (O-2387)

[Cathinone](#)

[Methcathinone](#)

[Ethcathinone](#)

[Buphedrone](#)

NEB

NEP

[Pentedrone](#)

[Dimethylcathinone](#)

[Diethylpropion](#)

[Bupropion](#)

~~Mephedrone~~

3-MMC

3-MEC

3-EMC

3-EEC

[4-EMC](#)

4-EEC

[Benzedrone](#)

[4-MEC](#)

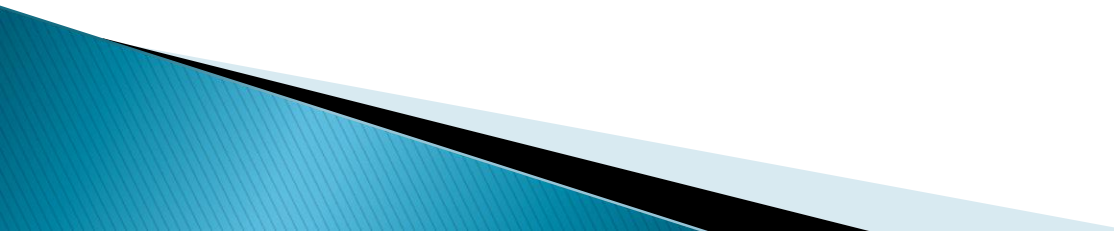
N,N-DMMC

N,N-DEMC

EDMC

[3,4-DMMC](#)

MDPV Timeline

- ▶ MDPV was developed in the 1960s, and has been used for the treatment of chronic fatigue, but caused problems of abuse and dependence.
 - ▶ **1969:** Boehringer Ingelheim files a patent application for MDPV.
 - ▶ **2005:** MDPV appears as a recreational drug; first mention on Drugs-Forum.
 - ▶ **2007:** First seizure of MDPV as a recreational drug, by customs officials in the German state of Saxony. The drug had been shipped from China.
 - ▶ **2008:** First seizure of MDPV in the United States.
 - ▶ **2009:** MDPV made illegal in Denmark.
 - ▶ **2010:** MDPV made a controlled drug in the UK, Sweden, Germany, Australia and Finland. First reports of the widespread retail marketing of 'bath salts' containing MDPV in the US. The US considers both Mephedrone (July, 2010) and MDPV (December, 2010) "a drug and chemical of concern".
 - ▶ **2011:** MDPV sale and possession are banned in 31 US States, with legislation being introduced in many other states.
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The Effects of MDPV

- ▶ MDPV is a powerful stimulant that functions as a dopamine–norepinephrine reuptake inhibitor (NDRI). It has stimulatory effects on the central nervous system and cardiovascular system.
 1. physical: rapid heartbeat, increase in blood pressure, vasoconstriction, sweating.
 2. mental: euphoria, increases in alertness & awareness, increased wakefulness and arousal, anxiety, agitation, perception of a diminished requirement for food and sleep.
- ▶ MDPV reportedly has four times the potency of Ritalin and Concerta.
- ▶ MDPV is sometimes labeled online as legal cocaine or legal amphetamines.
- ▶ The effects have a duration of roughly 3 to 4 hours, with after effects such as tachycardia, hypertension, and mild stimulation lasting from 6 to 8 hours. High doses have been observed to cause intense, prolonged panic attacks in stimulant–intolerant users, and there are anecdotal reports of psychosis from sleep withdrawal and addiction at higher doses or more frequent dosing intervals.

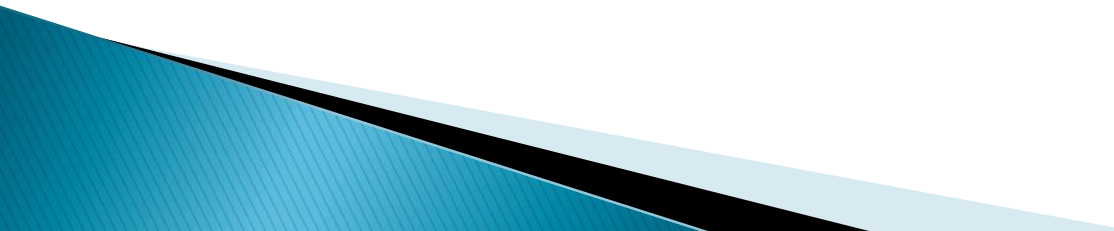
Synthetic Cathinones Effects Summary Sheet

- Aggression
 - Agitation
 - Breathing difficulty
 - Bruxism (grinding teeth)
 - Confusion
 - Dizziness
 - Extreme anxiety sometimes progressing to violent behavior
 - Fits and delusions
 - Hallucinations
 - Headache
 - Hypertension (high blood pressure)
 - Increased alertness/awareness
 - Increased body temperature, chills, sweating
 - Insomnia
 - Kidney pain
 - Lack of appetite
 - Liver failure
 - Loss of bowel control
 - Muscle spasms
 - Muscle tenseness
 - Vasoconstriction (narrowing of the blood vessels)
 - Nausea, stomach cramps, and digestive problems
 - Nosebleeds
 - Psychotic delusions
 - Pupil dilation
 - Renal failure
 - Rhabdomyolysis (release of muscle fiber contents [myoglobin] that could lead to kidney problems)
 - Severe paranoia
 - Suicidal thoughts
 - Tachycardia (rapid heartbeat)
 - Tinnitus
- 

Any Dangers Involved in MDPV

- ▶ Yes. Until a drug is tested, it cannot be considered safe. MDPV and its 'chemical cousins' have not been tested by the FDA and thus little is known as to the harm potential. Some anecdotal stories involving 'bath salt' usage and their potential for harm come in news stories from across the nation, local emergency room reports and data collected from the American Association of Poison Control Center.
- ▶ In New Jersey, on March 16, 2011 a young man reportedly addicted to Bath Salts and also suffering from Bipolar Disorder, killed his girlfriend at his home. This tragic death of a Rutgers University student prompted three NJ legislatures to introduce a bill to ban the active ingredients in these "bath salts".
- ▶ There have been reports that clients are reporting chest pains, increased blood pressure, increased heart rate, agitation, hallucinations, extreme paranoia, and delusions and suicidal thoughts. One online report from Louisiana has attempted to correlate 3 deaths with prior usage of MDPV. Many of the anecdotal reports are saying these compounds found in "bath salts" can quickly cause people to crave re-use of the substance, and are strongly addicting.

Addiction Potential of Cathinones?

- ▶ New research (December 14, 2011) by scientists at the National Institute on Drug Abuse (NIDA) indicates that the active compounds in "bath salts" (mephedrone and methylone) bind to monoamine transporters on the surface of some neurons.
 - ▶ This in turn leads to an increase in the brain chemical serotonin, and to a lesser extent, dopamine, suggesting a mechanism that could underlie the addictive potential of these compounds.
 - ▶ "Our data demonstrate that designer methcathinone analogs are substrates for monoamine transporters, with a profile of transmitter-releasing activity comparable to 3,4-methylenedioxymethamphetamine (MDMA, or 'ecstasy')."
 - ▶ "Given the widespread use of mephedrone and methylone, determining the consequences of repeated drug exposure warrants further study."
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Mephedrone (new research)

- ▶ Analysis of the ratio of the AUC for dopamine (DA) and serotonin (5-HT) indicated that mephedrone was preferentially a serotonin releaser, with a ratio of 1.22:1 (serotonin vs. dopamine).
- ▶ Additionally, half-lives for the decrease in DA and 5-HT were calculated for each drug. Mephedrone had decay rates of 24.5 minutes and 25.5 minutes, respectively.
- ▶ MDMA had decay values of 302.5 minutes and 47.9 minutes, respectively, while amphetamine values were 51 minutes and 84.1 minutes, respectively.
- ▶ Taken together, these findings show that mephedrone induces a massive increase in both DA and 5-HT, combined with rapid clearance. The rapid rise and subsequent fall of DA levels could explain some of the addictive properties that mephedrone displays in some users.

Temporary Federal Ban October 21 ,2011

- ▶ On October 21, 2011, the United States Drug Enforcement Administration (DEA) exercised its emergency scheduling authority to control three synthetic stimulants (Mephedrone , 3,4 methylenedioxypropylone (MDPV) and Methylenedioxymethamphetamine) used to make products marketed as “bath salts” and “plant food”.
- ▶ Except as authorized by law, this action makes possessing and selling these chemicals, or the products that contain them, illegal in the United States.
- ▶ These chemicals will be controlled for at least 12 months, with the possibility of a six month extension, while the DEA and the United States Department of Health and Human Services (DHHS) further study whether these chemicals should be permanently controlled.
- ▶ In this press release, DEA Administrator Michele M. Leonhart stated *“these chemicals pose a direct and significant threat, regardless of how they are marketed, and we will aggressively pursue those who attempt their manufacture and sale.”*
- ▶ The “Food and Drug Administration Safety and Innovation Act” (now a law as of July 9, 2012) extends temporary bans from 18 months in total, to 36 months in total.

FDA Safety and Innovation Act

- ▶ The “Food and Drug Administration Safety and Innovation Act” (2012) is proposing to extend temporary bans from 18 months in total, to 36 months in total.
- ▶ The Senate on May 24, 2012 passed the “Food and Drug Administration Safety and Innovation Act” which has in it, a synthetic drug section (Title XI, Subtitle D – Section 1152).
- ▶ This act, passed by both houses of Congress, bans 31 different synthetic drugs. The first version of this bill passed by the house had 17 synthetic cathinones (and cathinone substitutes) listed. However, this section was reduced significantly when pass through the Senate, and the final bill appears to have gone from **17** to **2**: **MDPV** and **Mephedrone**.
- ▶ The FDA Safety and Innovation Act was signed into law by President Obama on July 9, 2012.

Dangers/Legal Issues – AAPCC Data

- ▶ In 2010 there were 304 calls about MDPV (bath salt) products according to the American Association of Poison Control Centers' National Poison Data System (NPDS).
- ▶ As of June 30, 2012 poison centers reported 1,717 calls for all of 2012 (6,138 calls in 2011). This shows the trend of how popular this class of drug has become, but it also shows that since the national ban, decreased usage, in the form of poison control center calls, is evident (1,717 calls in the first 6 months of 2012 and 3,490 calls in the same time period of 2011).
- ▶ Since the National ban MDPV, Mephedrone and Methyone on October 21, 2011, November 2011 saw 231 calls reported, December 2011 – 222 calls, January 2012 – 228 calls, February 2012 – 230 calls, March 2012 – 264 calls, April 2012 saw 285 calls, May 2012 saw 295 calls and a spike in June 2012 which saw 415 calls. This is clear evidence that the national and state bans are having an impact on the use of, and medical necessity reasons to contact emergency rooms, for the chemicals that comprise “bath salts”.
- ▶ A continued watch of this emerging trend, since the national ban was enacted can be found at <http://www.aapcc.org> as they update their statistics monthly.

39 States have made Bath Salts Illegal

- ▶ As of July 9, 2012, here are the known states to have banned Bath Salts; banning either Mephedrone, MDPV, Methylone and/or other cathinones (this list has literally grown rapidly, so please understand if a state has not been listed here that recently passed a ban):
- ▶ **Alabama** (MDPV, Mephedrone)
- ▶ **Arkansas** (MDPV, Mephedrone, Methylone, 3-FMC, 4-FMC [Flephedrone], BK-PMMA [Methedrone])
- ▶ **Arizona**
- ▶ **Connecticut**
- ▶ **Delaware** (MDPV, Mephedrone, Methylone)
- ▶ **Florida** (MDPV, Mephedrone, Methylone, 3-FMC, BK-PMMA)
- ▶ **Georgia** (MDPV, Mephedrone, Methylone, 4-FMC [Flephedrone], BK-PMMA [Methedrone])
- ▶ **Hawaii** (MDPV, Mephedrone)
- ▶ **Idaho** (MDPV, Mephedrone)
- ▶ **Indiana**
- ▶ **Illinois** (MDPV)
- ▶ **Iowa**
- ▶ **Kansas** (MDPV, Mephedrone, Methylone, 3-FMC, 4-FMC [Flephedrone], BK-PMMA [Methedrone], Butylone)
- ▶ **Kentucky** (MDPV, Mephedrone, Methylone)
- ▶ **Louisiana** (MDPV, Mephedrone, Methylone, 4-FMC [Flephedrone], BK-PMMA [Methedrone])
- ▶ **Maine** (MDPV, Mephedrone, Methylone, 3-FMC, 4-FMC [Flephedrone], BK-PMMA [Methedrone], Butylone)
- ▶ **Michigan**
- ▶ **Minnesota**
- ▶ **Mississippi** (MDPV, Mephedrone)
- ▶ **Missouri** (MDPV, Mephedrone, MPBP [4'-Methyl- α -pyrrolidinobutiophenone])

39 States have made Bath Salts Illegal

- ▶ As of July 9, 2012, here are the known states to have banned Bath Salts; banning either Mephedrone, MDPV, Methylone and/or other cathinones (this list has literally grown rapidly, so please understand if a state has not been listed here that recently passed a ban):
- ▶ **New Jersey** (MDPV, Mephedrone, Methylone, 3-FMC, 4-FMC [Flephedrone], BK-PMMA [Methedrone])
- ▶ **New Mexico** (MDPV, Mephedrone, Methylone, 3-FMC, 4-FMC [Flephedrone], BK-PMMA [Methedrone])
- ▶ **New York** (MDPV, Mephedrone, Methylone, 3-FMC, 4-FMC [Flephedrone], BK-PMMA [Methedrone])
- ▶ **North Carolina** (MDPV, Mephedrone)
- ▶ **North Dakota** (Mephedrone only)
- ▶ **Ohio** (MDPV, Mephedrone, Methylone, 3-FMC, 4-FMC [Flephedrone], BK-PMMA [Methedrone])
- ▶ **Oklahoma** (MDPV, Mephedrone, Methylone, 3-FMC, 4-FMC [Flephedrone], BK-PMMA [Methedrone])
- ▶ **Oregon** (MDPV, Mephedrone, Methylone, 4-FMC [Flephedrone], BK-PMMA [Methedrone], Butylone)
- ▶ **Pennsylvania** (MDPV, Mephedrone, Methylone, 3-FMC, 4-FMC [Flephedrone], BK-PMMA [Methedrone])
- ▶ **South Carolina** (MDPV, Mephedrone, Methylone)
- ▶ **South Dakota**
- ▶ **Tennessee** (MDPV, Mephedrone, Methylone, 3-FMC, 4-FMC [Flephedrone], BK-PMMA [Methedrone])
- ▶ **Texas** (MDPV, Mephedrone, Methylone, 3-FMC, 4-FMC [Flephedrone], BK-PMMA [Methedrone])
- ▶ **Utah** (MDPV, Mephedrone, Methylone, 3-FMC, 4-FMC [Flephedrone], BK-PMMA [Methedrone], Butylone)
- ▶ **Virginia** (MDPV, Mephedrone)
- ▶ **Washington** (MDPV, Mephedrone, and synthetic cannabinoids, analogues) – Effective November 3, 2011
- ▶ **West Virginia** (MDPV, Mephedrone)
- ▶ **Wisconsin** (MDPV, Mephedrone)
- ▶ **Wyoming** (MDPV, Mephedrone, Methylone, 3-FMC, 4-FMC [Flephedrone], BK-PMMA [Methedrone])

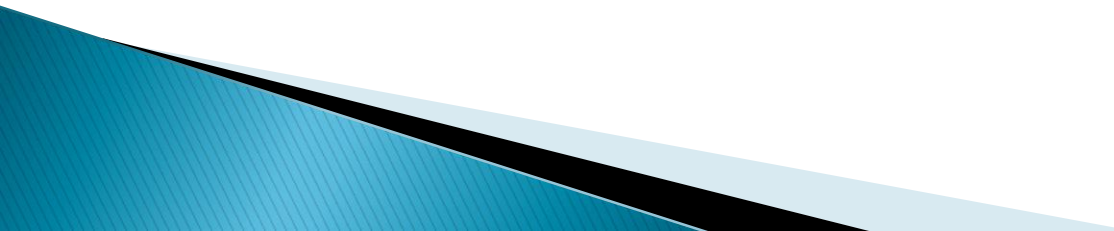
New Jersey Legal Issues

- ▶ On April 29th, 2011 MDPV, Mephedrone, Methylone and 3 other synthetic cathinones were banned in New Jersey.
- ▶ This ban in New Jersey was caused by very swift action by the legislature and Division of Consumer Affairs. On March 16, 2011, it was announced Assembly Deputy Speaker John McKeon (D-Essex), Assemblywoman Linda Stender (D-Union), and state Senator John Girgenti (D-Passaic) sponsored the legislation introduced into the Assembly and Senate, that led to the ban on MDPV, Mephedrone, Methylone and the 3 other synthetic stimulants 6 weeks later. The 6 banned substances are:
 1. 3,4 – Methylenedioxypropylone (MDPV)
 2. 4 – Methylmethcathinone (Mephedrone, 4-MMC)
 3. 3,4 – Methylenedioxymethcathinone (Methylone, MDMC)
 4. 4 – Methoxymethcathinone (Methedrone, bk-PMMA, PMMC)
 5. 4 – Fluoromethcathinone (Flephedrone, 4-FMC)
 6. 3 – Fluoromethcathinone (3-FMC)

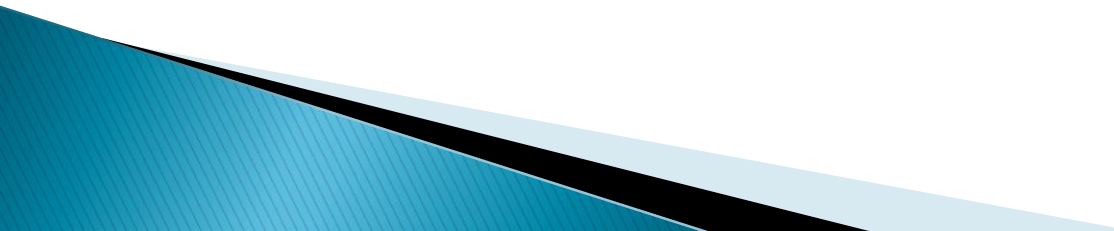
Legal Issues of MDPV – NJ

- ▶ Because of the state ban on April 29, 2011, this currently means in New Jersey MDPV and many of its derivatives and analogues (or chemical cousins to use the term from a previous slide), are no longer accessible.
- ▶ In other states where bans have not been in place, the product is being sold as ‘bath salts’ and labeled “Not For Human Consumption”, thus there are no age restrictions on the purchase of these products (as you have with other legal, intoxicating substances such as alcohol).
- ▶ Governor Christie made this temporary action permanent by signing Pamela's Law, banning the sale and possession of the 6 aforementioned synthetic cathinones. Pamela's Law was named after Pamela Schmidt, a 22-year-old Rutgers student who is believed to have been murdered by her boyfriend, Bill Parisio, who is said to have been under the influence of “bath salts” at the time of the March incident.
- ▶ However, toxicology results of Mr. Parisio taken shortly after the murder showed there were **none of these synthetic cathinones** in his system.

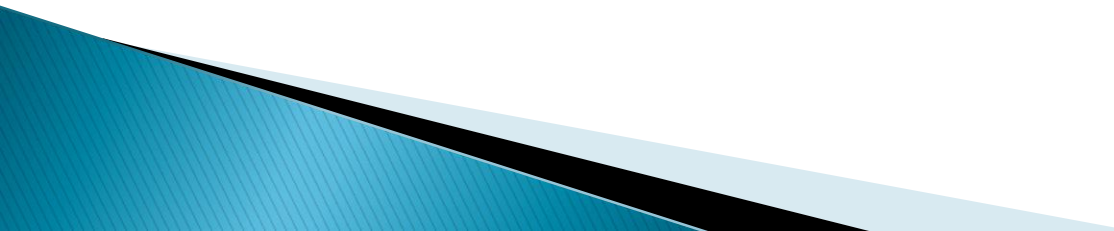
National vs. State-by-State Bans

- ▶ Because national public health officials have MDPV, Mephedrone and Methylone on their radar, it has been placed on a 12 month temporary national ban that started on October 21, 2011.
 - ▶ In December, 2010, the DEA made a brief statement: “Currently, MDPV is not a scheduled drug under the Controlled Substances Act (CSA). However, if intended for human consumption, MDPV can be considered an analogue of a schedule I drug under the CSA (Title 21 United States Code 813). Therefore, law enforcement cases involving MDPV can be prosecuted under the Federal Analogue Act of the CSA.” However, all “bath salts” clearly state “Not for Human Consumption”.
 - ▶ What this means is that (if in your state) MDPV is not a scheduled drug currently, if the intention is to use it for human consumption, its structural similarity to illegal drugs of abuse means that it could be considered by law enforcement officials as a controllable substance analogue (under the Federal Analogue Act).
- 

National vs. State-by-State Bans

- ▶ Just because a federal ban is enacted on a drug, it does not mean local authorities will take action on this drug.
 - ▶ States still need to enact legislation to ban the substances in order for state (then local) authorities to take action.
 - ▶ Federal bans will go after larger distributors, but it will be locally determined as to whether users and smaller, local distributors (such as non-chain convenience stores and gas stations) will be sought after without a state ban.
- 

Will the State and National Bans Work?

- ▶ This is from a recent study out of the United Kingdom.
 - ▶ Mephedrone (4-methylmethcathinone) and related cathinones were controlled in the United Kingdom on 16 April 2010.
 - ▶ An analysis of presentations to the emergency department of patients with acute toxicity related to the use of mephedrone demonstrated that there was a peak in presentations prior to and a significant fall in presentations following the control of mephedrone.
 - ▶ This suggests that the control of mephedrone in the United Kingdom may have been effective in reducing the acute harm associated with the drug.
- 

Urine Detection Information

- Redwood Toxicology Laboratory shows currently they have detection for MDPV and Mephedrone. They do not have detection for α -PPP, MPPP or MDPPP in urine drug screens. The cost for the 2 panel is \$40 (\$30 if you do enough volume and have your entire drug screen business with Redwood Lab.), and \$55 (\$40) for the 14 panel test. There is reportedly a 48–72 hour detection window, depending on dosing.
- Redwood has a 2 panel drug test (MDPV, Mephedrone) and a 14 panel drug test which tests for the following drugs:
 1. BZP (*Benzylpiperazine*)
 2. Butylone (β -keto-*N*-methylbenzodioxolylpropylamine, *bk*-MBDB)
 3. Cathinone (*Khat* or *Benzoylethanamine*)
 4. Ethylone (*3,4*-methylenedioxy-*N*-ethylcathinone, MDEC, *bk*-MDEA)
 5. MBDB (*Methylbenzodioxolylbutanamine*, *Methyl-J*, “Eden”)
 6. *m*CPP (*meta*-Chlorophenylpiperazine)
 7. MDA (*3,4*-Methylenedioxyamphetamine, *tenamfetamine*)
 8. MDEA (*3,4*-Methylenedioxy-*N*-ethylamphetamine, MDEA, MDE, “Eve”)
 9. MDPV (*Methylenedioxy*pyrovalerone, *Cloud 9*, *Ivory Wave*, *White Lightning*)
 10. MDMA (*3,4*-Methylenedioxymethamphetamine, *ecstasy*, “E”, “X”)
 11. Mephedrone (*4*-methylmethcathinone [*4*-MMC], *4*-methylephedrone, “Meph”, “MCat”)
 12. Methcathinone (α -methylamino-*propiophenone*, may be confused with mephedrone)
 13. Methylone (*3,4*-methylenedioxy-*N*-methylcathinone, *bk*-MDMA, MDMC, “M1”)
 14. TFMPP (*3*-Trifluoromethylphenylpiperazine, “Legal X”)

How bad are doing “bath salts” for you?

This bad ... **Man arrested after being found standing over goat, wearing women's underwear**

<http://bit.ly/mr2xny>

- ▶ **May 3, 2011. CHARLESTON, W.Va.** – An Alum Creek man has been arrested after neighbors allegedly found him standing over the dead body of a boy’s stolen pet pygmy goat while wearing women's underwear.
- ▶ The goat was named Bailey, was on a leash attached to a tree in the front yard. The small white-and-gray goat wore a pink collar.
- ▶ The 19 year old man told deputies he had been high on bath salts for the last three days, said a detective with the sheriff's office.
- ▶ Two of the three people who were with the boy who’s pet pygmy goat was abducted, went to the suspect's home to look for the goat and found the front door open. They went inside the house, and one went into the middle bedroom where she found the suspect in a bra and woman's panties standing three feet from the goat's body. The suspect then ran out of the house wearing only a muscle shirt and thong underwear.

Bath salts are ‘cross dress, kill a little boy’s pet pygmy goat, then run in public’ bad.

Bath Salts and the Zombie Apocalypse



YOH YOH YOH.

Bath Salts and the Zombie Apocalypse

The Anecdotal “Evidence” ...

- ▶ **May 3, 2011. CHARLESTON, W.Va.** – An Alum Creek man has been arrested after neighbors allegedly found him standing over the dead body of a boy’s stolen pet pygmy goat while wearing women's underwear. This was our trendsetter <http://bit.ly/mr2xny>.
- ▶ **May and June, 2012** – A veritable outbreak of Zombie type behaviors with people the media reported that were supposedly on bath salts (mostly in Florida ... fill in your own thoughts on this):
 1. [Florida Man \(Rudy Eugene\) Eats 75% of Another Man’s Face](#)
 2. [NJ Man Flings His Own Intestines at Police Who Try to Arrest Him](#)
 3. [Man on Bath Salts Bites a Chunk of Person’s Face in Domestic Dispute](#)
 4. [Man on Bath Salts Threatens to Eat Police Who Try to Arrest Him](#)
- ▶ Of course the most infamous of these is link #1, where the mother actually talked to the press to announce that her now deceased son (they had to kill him as when the police tried to stop him from eating the other man he merely growled at them) “was no zombie” and his former girlfriend stated he was either drugged or possessed. [Rudy Eugene was on marijuana only, not bath salts](#). He was also found to have no human flesh in his stomach. However, the lab only tested for 6 chemicals, and as we have seen there are more than 6 chemicals being used/labeled as “bath salts”.
- ▶ It doesn’t help that Center for Disease Control has [a permanent internet website dedicated to how to best handle a Zombie Apocalypse](#).

Not Zombies ... Yet Bath Salts are deadly

More recent rash of bizarre and deadly bath salts incidents

- ▶ **June 18, 2012. Houston, Texas** – A man was found in the middle of a busy street shouting incoherently at oncoming traffic that swerved to miss him. Police finally got him out of the traffic when he “displayed signs of excited delirium” before he stopped breathing. He was pronounced dead at the hospital and had bath salts on him.
- ▶ **June 15, 2012. Robinson, Illinois** – A naked man grabs onto random car hood while naked and surfs car hood for 4 miles. The driver calls 911 and drives 4 miles to meet police who then arrested the man, who had vials purportedly containing bath salts on him. He was “hallucinating wildly” ... as opposed to hallucinating modestly.
- ▶ **June 14, 2012. Miami, Florida** – A naked woman punched and choked her 3 year old son before the son was rescued by onlookers. She then grabbed her dog and did the same before the police came and tasered. She died from cardiac arrest as a result of the tasing (and likely drugs).

Bath Salts and the Zombie Apocalypse

The Facts ...

- ▶ MDPV, Mephedrone, and other synthetic cathinones can cause serious psychiatric symptoms in people who have never exhibited such symptoms prior to usage.
- ▶ This can happen for some, while others will never experience these symptoms under the influence of these chemicals. However, the prevalence of people having abreactions is evident in Poison Control Center data, and in these types of anecdotal stories linked in the previous slide.
- ▶ For those who have pre-existing psychiatric problems, ingesting these substances can further fracture and intensify these pre-existing psychiatric symptoms, which can be expressed in violent ways by some.
- ▶ There is no evidence of continued "zombification" of bath salt users after the drugs have left their system. Thus any zombie like tendencies (i.e., aggression leading to the severe mutilation of oneself or others) that could possibly exist, would only do so while under the influence, and wouldn't persist after the effects of the drug have left a person's system.
- ▶ Sorry, no Hollywood zombie apocalypse is evident with "bath salts" ingestion, only tragic consequences.

Emerging Drugs of Abuse

Synthetic Cannabinoids – Spice/K2

Glenn Duncan LPC, LCADC, CCS, ACS

Presentation Last Updated 28-Aug-12

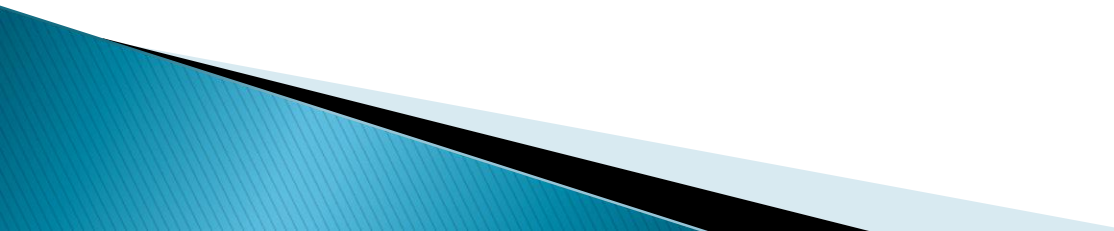
K2 / Spice – Synthetic Cannabinoids



K2 /Spice – Synthetic Cannabinoids

- ▶ The terms Spice and K2 refer to commercially available products that have been sprayed with research chemicals called synthetic cannabinoids but do not contain any cannabis (marijuana) components.
- ▶ Currently illegal in New Jersey (and there is an emergency national ban on 5 synthetic cannabinoids), they are sold in local markets throughout the U.S. including gas stations, liquor stores, convenient stores, smoke shops, or on the Internet under the brand names "K2," "Spice," "Chronic Spice," "Spice Gold," "Spice Silver," "Stinger," "Yucatan Fire," "Skunk," "Pulse," "Black Mamba," "Mystery," "Red X Dawn," "Zohai," "Mr. Nice Guy," "Spicylicious," "K3," "K3 Legal," "Earthquake," or "Genie." This listing of names only covers some of the brand names, where more brand names crop up very often.

What are Synthetic Cannabinoids

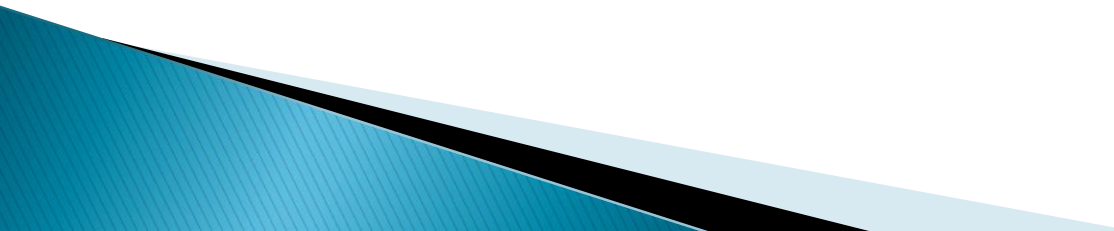
- ▶ Synthetic cannabinoids are a structurally diverse class of mostly synthetic substances that bind to cannabinoid receptors in our body, and when ingested create a similar type of high that naturally occurring cannabinoids (marijuana) produce.
 - ▶ More than 250 different synthetic cannabinoids have been created (mostly created in laboratories for research purposes).
 - ▶ The psychoactive compounds found in Generation 1 of Spice and K2 include the synthetic cannabinoids JWH-018, JWH-073, JWH-250, CP 47,497 and/or CP 47,497 C8. Other synthetic cannabinoids include JWH-019, JWH-081, JWH-200, HU-210, CP 55,940 (we have a more comprehensive listing later in this presentation).
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The History of Spice

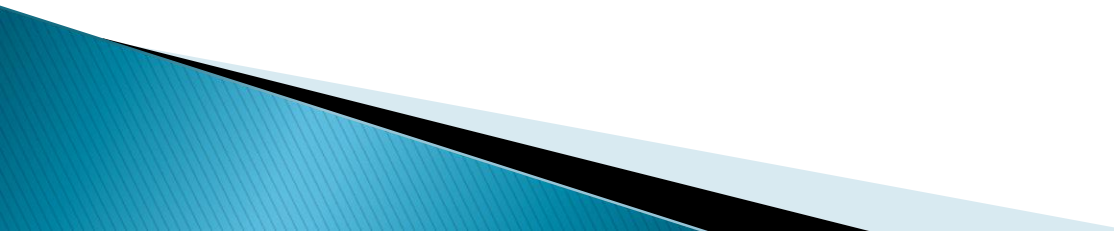
- ▶ The cannabinoid-like chemicals were developed in research laboratories, for example, to study neuronal receptors found in the body and brain.
- ▶ One of these synthetic cannabinoids, JWH-018, was first made in 1995 for experimental purposes in the lab of Clemson University researcher John W. Huffman, PhD.
- ▶ It is believed that the manufacturers of "Spice" read the research (circa 2004) and copied it in order to reproduce Dr. Huffman's chemicals to produce the synthetic cannabinoid and market it for commercial distribution.



The History of Spice

- ▶ The cannabinoid-like chemicals were developed in research laboratories to study neuronal receptors found in the body and brain, or for other research purposes.
 - ▶ The five nationally banned synthetic cannabinoids are JWH-018, JWH-073, JWH-200, CP 47,497 and cannabicyclohexanol (CP 47,497 C8, a homologue of CP 47,497).
 - ▶ CP 47,497 was developed in 1980 by Pfizer and has analgesic properties. Cannabicyclohexanol (CP 47,497 C8) was developed by Pfizer in 1979.
- 

The History of Spice

- ▶ HU-210 and HU-211 were first synthesized in 1988 at Hebrew University in Israel, and they have anti-inflammatory and anesthetic properties, respectively.
 - ▶ While HU-210 is anywhere from 100 to 800 times more potent than natural THC, and is a potent analgesic, HU-211 does not act on the cannabinoid receptor and does not produce cannabis type effects when ingested, though it is commonly listed as a synthetic cannabinoid.
 - ▶ HU-210 is currently classified nationally as a schedule 1 controlled substance, though state by state it may be legal.
- 

The History of Spice

- ▶ The brand "Spice" was released in 2004, and in 2006 the brand gained popularity, particularly throughout Europe. The company that started Spice went from assets of 65,000 Euros in 2006 to 899,000 Euros in 2007.
 - ▶ Spice was the dominant brand until 2008 when competing brands hit the market (such as K2).
 - ▶ In 2009 Spice products were identified in 21 countries. Spice, K2 and other products peaked in popularity in 2008 in Europe, with many European countries banning it at that time.
 - ▶ In 2009, Spice, K2 and others gained their popularity in Canada and the United States.
- 

The Effects of Spice/K2

- ▶ Since the psychoactive ingredients are similar to those of naturally grown marijuana, the effects are similar.
- ▶ Synthetic cannabinoids are listed as the same class of drug as marijuana; a hallucinogen.
- ▶ The effects of smoking JWH-018 has a variable duration. Some sites we have viewed report the high lasts probably an average of 10–30 minutes, while anecdotal reports from users of K2 report effects lasting for 1–2 hours.
- ▶ Synthetic cannabinoids have tested at least 5 – 45 times more potent than some of the strongest marijuana (with HU-210 again being 100–800 times more potent than naturally occurring THC).
- ▶ A neurophysiology theory on the better potency of synthetic cannabinoids over natural marijuana is that the synthetic cannabinoids bind better and longer to the CB1 and CB2 receptors than does natural THC.

Different Synthetic Compounds

This is a partial listing of known compounds.

■ AM-630	JWH-018
■ AM-679	JWH-019
■ AM-694	JWH-073
■ AM-1221	JWH-081
■ AM-1241	JWH-122
■ AM-2201	JWH-133 (non-psychoactive)
■ CB-25	JWH-200
■ CB-52	JWH-201
■ CP 47,497	JWH-203
■ CP 47,497 C8	JWH-210
■ CP 55,940	JWH-250
■ HU-210	JWH-251
■ HU-211	JWH-398
■ HU-308	RCS-4
■ HU-331	RCS-8
■ JWH-007	WIN 48,098
■ JWH-015	WIN 55,212-2
	WIN 55,212-3
	MAM-2201
	UR-144
	XLR-11

Origins of Major Synthetic Classes

- ▶ **AM** prefaced compounds are fluorinated and named for Northeastern University professor **Alexandros Makriyannis**.
- ▶ **CP** compounds were developed in the late 1970's, early 1980's by **Pfizer**.
- ▶ **HU** compounds are named after **Hebrew University** where these compounds were first created and investigated.
- ▶ As stated earlier, **JWH** products were named after **John W. Huffman** from Clemson University.
- ▶ **RCS** compounds appear to have their origins of development in a single lab in mainland China.
- ▶ **WIN** compounds were developed by **Sterling Winthrop**.

So what is in the 2nd Gen of K2/Spice?


The **AM** class:

- This class contains hyperpotent cannabinoids based on CB1 binding affinity, with a fluorine on the end of the pentyl chain in an apparent attempt to increase duration of effect. **AM-2201** has been frequently reported.

The **RCS** class:

- With a chemical structure reminiscent of JWH-081, this synthetic cannabinoid has similar potency and effects to JWH-250, all allegedly without legal issues or the known JWH 'anxiety issues'. **RCS-4** has been frequently reported.

And Yes, The **JWH** class:

- In June and July of 2011, there have been anecdotal internet reports that **JWH-122** has been identified in Generation 2 of synthetic cannabinoids.
- 


So what is in the 2nd Gen of K2/Spice?

- ▶ Recently one supplier of herbal products is even giving out a product analysis report allegedly showing that their product contains none of the banned substances.
- ▶ Theorcrafting about what is in the next general of K2/Spice leans towards the RCS class. [Click this link to see the product analysis report](#) the herbal substance provider gave to their local outlets.
- ▶ There were **7 JWH** class drugs represented in the analysis (015, 018, 019, 073, 081, 200, and 250). There were also **3 CP** class drugs represented (47,497, 47,497 C8, 55,940); **4 HU** class drugs represented (210, 211, 308, 331); **2 WIN** (48,098, 55,212-2); and **1 AM** class represented in this analysis report (694).
- ▶ **Conspicuously absent from this report were the RCS and CB classes.** However, there is much more internet chatter regarding RCS class of synthetic cannabinoids than there is about the CB class (e.g., there is no CB class Wikipedia page, but there are rudimentary RCS class Wikipedia pages).

The Speed of Change – Generation 3

- ▶ Just to make the other two slides outdated, the front line people (chemists in labs trying to stay ahead of the curve and keep their drug testing relevant) have informed that they are seeing new trends.
- ▶ Yes they still see AM-2201, JWH and RCS-4 in products. Sherri Kacinko, a toxicologist for NMS Labs, states the following: “AM-2201, JWH and RCS-4 are “old news” around here. we are seeing a decrease in positivity in our biological specimens (though plenty are still positive) and a bigger decrease in the solid dosage products. The new biggies seem to be UR-144 and XLR-11.”
- ▶ Another person also reflected this sentiment and added that MAM-2201 is being found in recent (June, 2012) samples. So what are these new chemicals?
- ▶ According to Ms. Kacinko: “MAM-2201 is AM-2201 with a methyl group on the ring. XLR-11 is the UR-144 ([click this link to see info on UR-144](#)) with a Fluorine at the terminus of the side change (like AM-2201 is JWH-018 with a fluorine).”

Any Dangers Involved in Spice/K2 Use?

- ▶ Yes. Until a drug is tested, it cannot be considered safe. Not only have synthetic cannabinoids not been tested, nearly all were created for experimental use in animals and cell cultures, not tested for use in humans.
 - ▶ JWH-018 inventor John W. Huffman, PhD, puts it bluntly: "It is like Russian roulette to use these drugs. We don't know a darn thing about them for real."
 - ▶ These synthetic cannabinoids have been associated with impaired driving incidents, attempted suicides, and emergency department visits, and have been linked to such adverse effects as increased anxiety, panic attacks, heart palpitations, respiratory complications, aggression, mood swings, altered perception, and paranoia.
- 

Dangers/Legal Issues – AAPCC Data

- ▶ In 2010 there were 2,906 calls about synthetic marijuana products according to the American Association of Poison Control Centers' (AAPCC) National Poison Data System (NPDS).
- ▶ As of June 30, 2012 poison centers reported 3,372 calls in 2012 (6,959 in 2011). The 2011 has doubled 2010 in the number of reported cases to the AAPCC. This national ban, unlike the synthetic cathinones ban, does not appear to be having a major effect on usage as 2012 is on track to equal or top 2011.
- ▶ 2012 is set to either equal or surpass 2011:
 - From Jan 1 – Dec 31, 2010 there were 2,906 poison control center calls about synthetic cannabinoids.
 - From Jan 1 – June 30, 2011 there were 3,105 poison control center calls.
 - From Jan 1 – June 30, 2012 there were 3,372 poison control center calls.

National Legal Issues

- On November 24, 2010, the Federal Government took action to ban JWH-018, JWH-073, JWH-200, CP 47,497 and cannabicyclohexanol (CP 47,497 C8, which is a homologue of CP 47,497).
- The emergency ban was proposed to be in place for one year (March 2011 – March 2012, which has been extended for 6 more months) as federal officials study whether these 5 synthetic cannabinoid substances should be permanently controlled, **however there are over 250 synthetic cannabinoids!**
- The Federal Government recently started an initiative to solve this problem as shown in the Poison Control Center Data, that there are so many synthetic cannabinoids, a ban on a small % will do nothing to deter use.
- The Senate on May 24, 2012 passed the “Food and Drug Administration Safety and Innovation Act” which has in it, a synthetic drug section (Title XI, Subtitle D – Section 1152). They expect this bill to be signed into law by the president on or before July 4, 2012.

FDA Safety and Innovation Act

- **SEC. 1152. ADDITION OF SYNTHETIC DRUGS TO SCHEDULE I OF THE CONTROLLED SUBSTANCES ACT.**
- (a) **Cannabimimetic Agents**– Schedule I, as set forth in section 202(c) of the Controlled Substances Act (21 U.S.C. 812(c)) is amended by adding at the end the following:
 - ‘(d)(1) Unless specifically exempted or unless listed in another schedule, any material, compound, mixture, or preparation which contains any quantity of **cannabimimetic agents**, or which contains their salts, isomers, and salts of isomers whenever the existence of such salts, isomers, and salts of isomers is possible within the specific chemical designation.
 - (2) In paragraph (1):
 - ‘(A) The term ‘**cannabimimetic agents**’ means any substance that is a **cannabinoid receptor type 1 (CB1 receptor) agonist** as demonstrated by binding studies and functional assays.
- Thus the Federal Government is banning anything that binds to cannabinoid receptors (CB1 receptor as any drug that binds to CB2 does not produce a “high”)

FDA Safety and Innovation Act

- SEC. 1152. ADDITION OF SYNTHETIC DRUGS TO SCHEDULE I OF THE CONTROLLED SUBSTANCES ACT. (Which also specifically lists 18 chemicals)
- ‘(i) 5-(1,1-dimethylheptyl)-2-[(1R,3S)-3-hydroxycyclohexyl]-phenol (CP-47,497);
- ‘(ii) 5-(1,1-dimethyloctyl)-2-[(1R,3S)-3-hydroxycyclohexyl]-phenol (cannabicyclohexanol or CP-47,497 C8-homolog);
- ‘(iii) 1-pentyl-3-(1-naphthoyl)indole (JWH-018 and AM678);
- ‘(iv) 1-butyl-3-(1-naphthoyl)indole (JWH-073);
- ‘(v) 1-hexyl-3-(1-naphthoyl)indole (JWH-019);
- ‘(vi) 1-[2-(4-morpholinyl)ethyl]-3-(1-naphthoyl)indole (JWH-200);
- ‘(vii) 1-pentyl-3-(2-methoxyphenylacetyl)indole (JWH-250);
- ‘(viii) 1-pentyl-3-[1-(4-methoxynaphthoyl)]indole (JWH-081);
- ‘(ix) 1-pentyl-3-(4-methyl-1-naphthoyl)indole (JWH-122);
- ‘(x) 1-pentyl-3-(4-chloro-1-naphthoyl)indole (JWH-398);
- ‘(xi) 1-(5-fluoropentyl)-3-(1-naphthoyl)indole (AM2201);
- ‘(xii) 1-(5-fluoropentyl)-3-(2-iodobenzoyl)indole (AM694);
- ‘(xiii) 1-pentyl-3-[(4-methoxy)-benzoyl]indole (SR-19 and RCS-4);
- ‘(xiv) 1-cyclohexylethyl-3-(2-methoxyphenylacetyl)indole (SR-18 and RCS-8); and
- ‘(xv) 1-pentyl-3-(2-chlorophenylacetyl)indole (JWH-203).’

NJ Statewide Ban 02/28/12

- ▶ Bill [A2644](#) has been introduced by New Jersey Assemblywoman Mary Pat Angelini proposing to ban JWH-018, JWH-073 & HU-210 in May, 2010. On January 11, 2011, The NJ Senate Introduced an identical bill, S2606. This bill was referred to the [Senate Law and Public Safety Committee](#) where both sat until February 28, 2012.
- ▶ This Senate bill also only proposes to ban the same [three \(3\) compounds](#) the assembly bill proposes to ban, despite being introduced months after the proposed (and now enforced) emergency national ban (which has 5 substances listed).
- ▶ Realizing these bills were written poorly, they were reconstructed and on February 28, 2012, a New Jersey bill banning the entire class of substances was put into place. [Click here for the notice to law enforcement officials](#), and [click here for the actual legislation verbiage](#). The legislation was signed on February 28th, 2012 and distributed on the 29th. **This legislation seeks to imitate Washington State, North Carolina and Colorado in banning the entire class of the drug, not just individual chemicals (though individual chemicals are listed in the law).**

Final Conclusions

- ▶ While the temporary national ban of five synthetic cannabinoids will not be the end of this story. Already on the internet there are the K2 and Spice portals of sale, stating that "there is a new generation of K2 products that are completely legal everywhere."
- ▶ Not covered by any ban, restriction or regulation! These are: **K2 Sky**, **K2 Solid Sex**, **K2 Orisha**, **K2 Amazonian Shelter** and **K2 Thai Dream**. As stated earlier, at least one K2/Spice distributor even went through the trouble of having their product tested which reported none of the nationally banned substances were in their product. Recently the Department of Homeland Security has a different view about their product and the website they used to sell their products.
- ▶ The Federal Government (then followed by each State Government) banning this entire class of substances (any cannabinoid that binds to CB1), including their salts, isomers, derivatives, analogues and homologues could see a dramatic reduction in the use of synthetic cannabinoids.
- ▶ The question remains can such a broad brush uphold it's intent in the US Courts, and that remains to be seen.

Existing Drugs of Abuse Opiates, Cocaine and Alcohol

Glenn Duncan LPC, LCADC, CCS, ACS

Presentation Last Updated 28-Aug-12

Drug Trends – Existing Drugs of Abuse

Prescription Opiates



Drug Trends – Existing Drugs of Abuse

- ▶ **Prescription Opiates** – Prescriptions for Opiates is the number one prescription in the United States, with cholesterol lowering drugs being 2nd.
- ▶ Accidental drug overdoses is the 2nd leading cause of accidental deaths, only overshadowed by car accidents.
- ▶ Prescriptions for opiates have increased by 1000% since the late 1990s.
- ▶ In the 1970's Heroin had a purity level that hovered around 6%, and today, depending on the location, that purity level averages in NJ around 60%, with up to 74%. This has allowed for a significant increase in non intravenous drug use of heroin. Prescription opiates account for the other aspect of significantly increased Non-IV opiate drug use.
- ▶ In NJ, for the very first time, people coming into treatment (statistics are from licensed treatment facilities around the state of NJ), opiates have surpassed alcohol as the primary drug reported upon admission to treatment.

Drug Trends – Existing Drugs of Abuse

- ▶ The legal amount of Vicodin or Percoset that can be prescribed is the following: 120 pills per month or a monthly dosage. Dosages of Percoset and Vicodin are in 5/325; 7.5/325; and 10/325 (Oxycodone or Hydrocodone/Acetometaphin).
- ▶ Recently a doctor was found prescribing 100 10mg Percoset every 12 days for somebody's pain, or 300 pills every 36 days (or 250 pills per 30 day month).
- ▶ When asked, why so much, they stated the person's pain warranted this, as they had developed a physical tolerance to the medication.
- ▶ When asked why not switch to a more potent version of the drug (Oxycontin, which starts at 10mg tablets) that does not need 300 pills dispensed per month, the reply was the client is on Medicaid, and Medicaid only pays for Vicodin/Percoset.
- ▶ In NJ, for the very first time, people coming into treatment (statistics are from licensed treatment facilities around the state of NJ), opiates have surpassed alcohol as the primary drug reported upon admission to treatment.

Drug Trends – NJ Opiate Addiction Trends

- ▶ In NJ, for the very first time, people coming into treatment (statistics are from licensed treatment facilities around the state of NJ), opiates have surpassed alcohol as the primary drug reported upon admission to treatment. Statistically we can say that this surge is due an increase of non
- ▶ Admissions: 1/1/2010 – 12/31/2010
Primary Drug

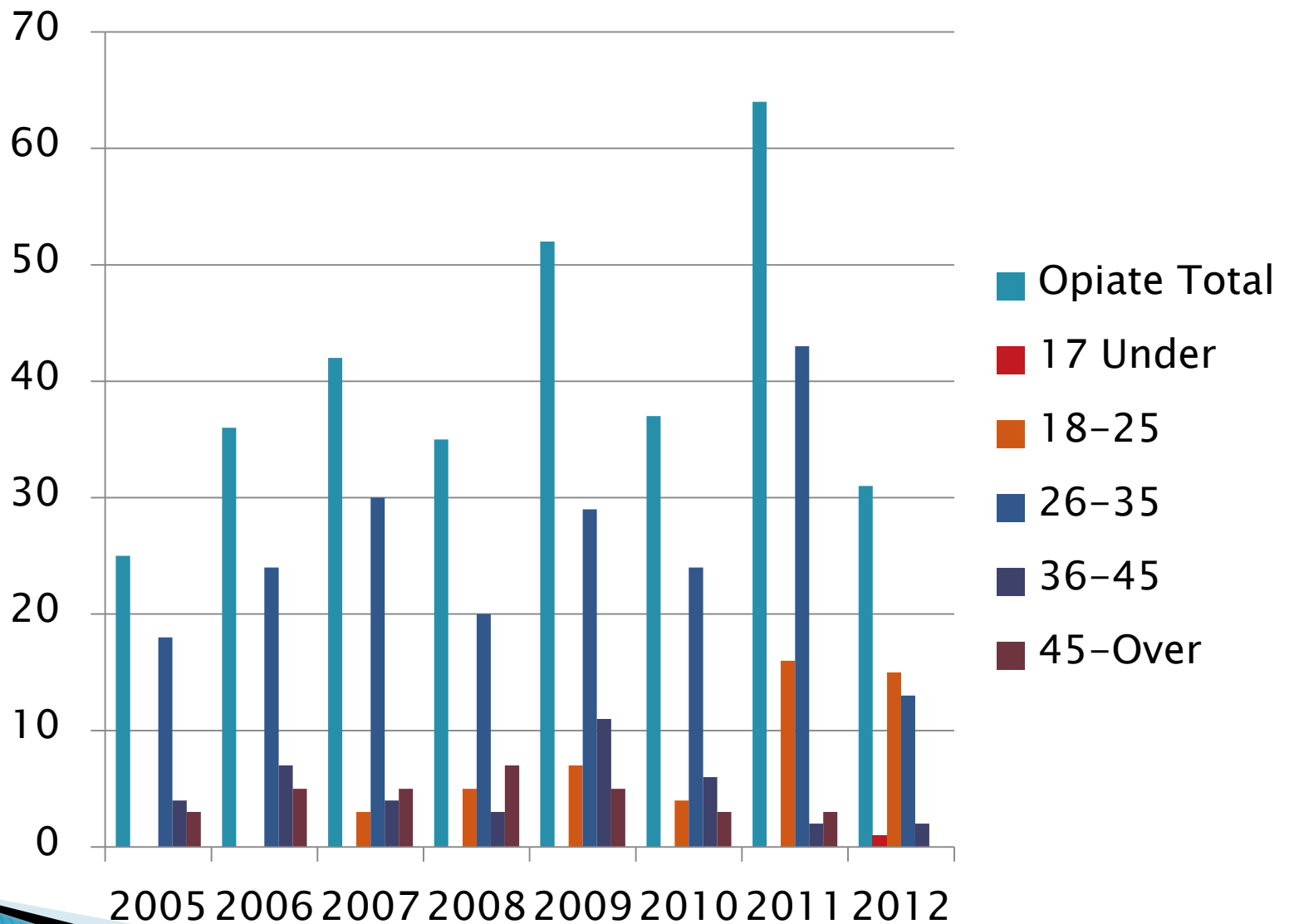
Heroin & Other Opiates	28,983	40%
(Intravenous Drug Users) 16,301	56%	
(Non-IV Drug Users) 12,682	44%	
Alcohol	23,473	34%
Marijuana	11,219	16%
Cocaine	4,769	07%
Other Drugs	2,193	03%

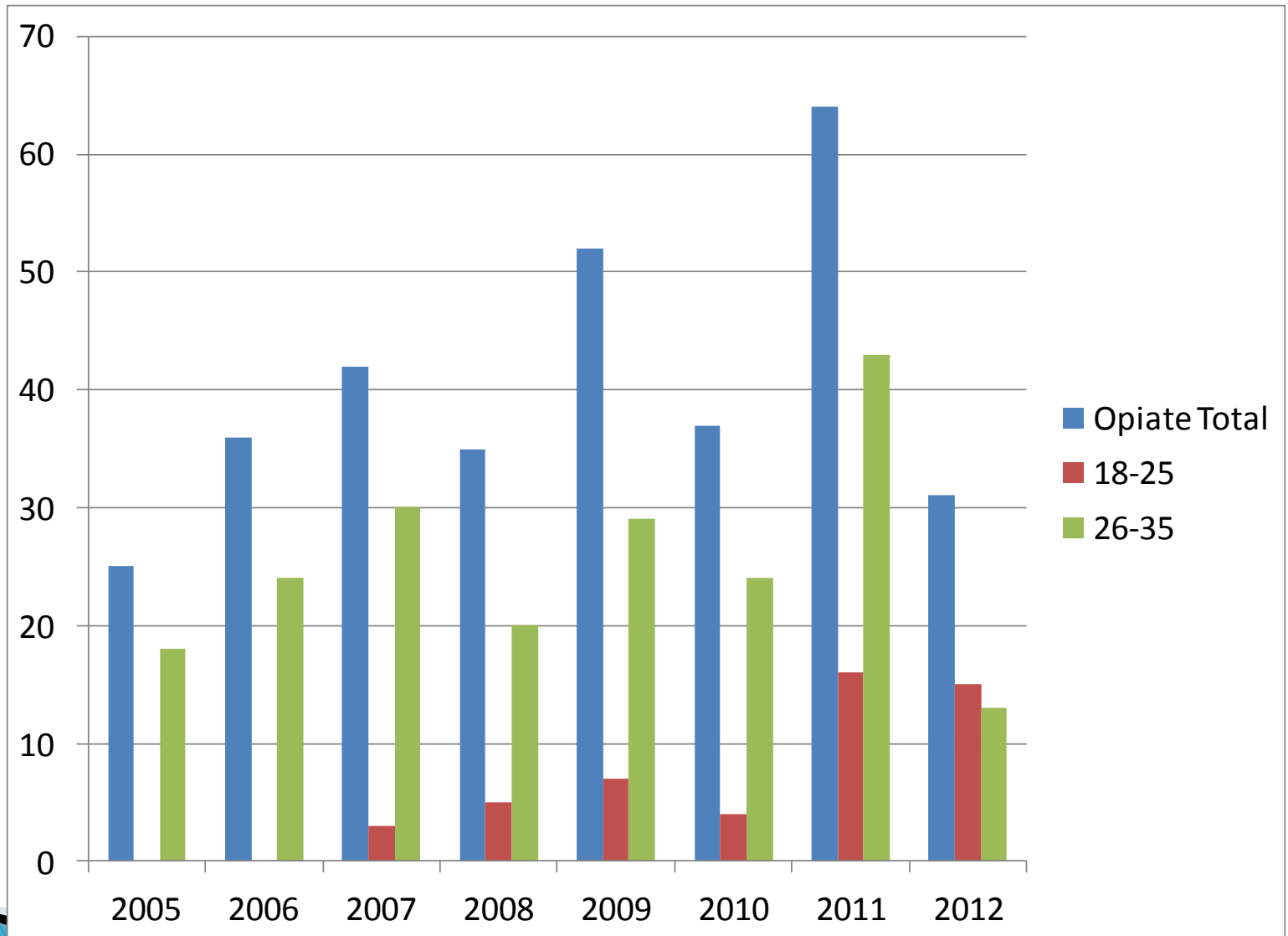
Drug Trends – NJ Opiate Addiction Trends

- Admissions: 1/1/2011 – 12/31/2011
- Primary Drug

Heroin & Other Opiates	31,107	42%
(Intravenous Drug Users)	17,733	57%
(Non-IV Drug Users)	13,374	43%
Alcohol	23,653	32%
Marijuana	12,061	16%
Cocaine	4,663	06%
Other Drugs	2,480	03%

2011 Heroin & Other Opiates	31,107	42%
2010 Heroin & Other Opiates	28,983	40%
2011 (IV Drug Users)	17,733	57%
2010 (IV Drug Users)	16,301	56%
2011 (Non-IV Drug Users)	13,374	44%
2010 (Non-IV Drug Users)	12,682	43%
(Net Gain 1,432)		
(Net Gain 692)		





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Drug Trends – Opiate Addiction Trends

- ▶ **The ease of obtaining the substance and how its done by individual addicts** (there are professional teams of people who doctor shop in states like Florida and then ship the supplies up through the northeast quadrant):
 1. **Step 1:** Have DOCUMENTED bad knees/other parts of your body; age also helps (the older the better, it's harder for a 20yo to prove sustained pain).
 2. **Step 2:** Find out what is maximum legal amount prescribed as a 1 month dosage. In NJ and FL it is 120 pills or a months supply as deemed by the doctor. If a doctor deems you need 400 pills per month, they have the legal capacity to prescribe as much.
 3. **Step 3:** Go to a doctor who's gives out medication like a PEZ dispenser
 4. **Step 4:** Shop around, they don't doctor shop per say (though many do), as that is illegal. However, what a good addict will do is to do their research, either first hand by going to different pain management practices, or researching on the internet. The object is to find the doctor who is willing to give you the most pills per month, and the highest dosage of those pills per month.

E.g., there is a local doctor in the greater Hunterdon County area who is the "go to guy", come in with the right MRI, X-Ray, etc., and correct income level [either low or high] and you could end up with 300 pills every 36 days.

Drug Trends – Existing Drugs of Abuse

- ▶ Cocaine laced with levamisole, a veterinary drug used for de-worming livestock, and it will make your flesh rot off.
- ▶ In 2009, the Substance Abuse & Mental Health Services Administration (SAMHSA) put out a warning that upwards of 70% of all reported cocaine samples had been laced with levamisole.
- ▶ Ingesting cocaine mixed with levamisole can seriously reduce a person's white blood cells, suppressing immune function and the body's ability to fight off even minor infections, and can experience overwhelming, rapidly-developing, life threatening infections.
- ▶ Symptoms for users of cocaine laced with levamisole include:
 - high fever, chills, or weakness
 - swollen glands
 - painful sores (mouth, anal)
 - any infection that won't go away or gets worse very fast, including sore throat or mouth sores –skin infections, abscesses –thrush (white coating of the mouth, tongue, or throat) –pneumonia (fever, cough, shortness of breath)

Drug Trends – Existing Drugs of Abuse

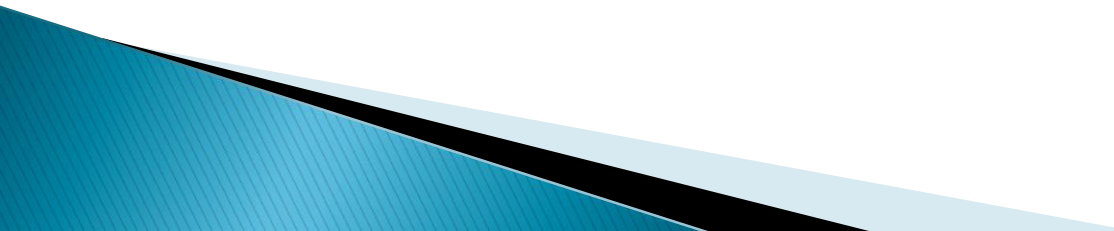
- ▶ There can't at this time be said that there is a definitive link between smoking or snorting levamisole–adulterated cocaine, however recent literature (e.g., 2011 article from the Journal of the American Academy of Dermatology [JAAD]), and anecdotal reports suggest that this link does exist.
- ▶ No one really understands why someone would add levamisole to cocaine, since it seems on the face of it to be bad business. However, levamisole has been shown to increase dopamine in the brain's reward pathway/circuit and so may actually enhance the effect of cocaine.
- ▶ The authors (from the JAAD article) note that a 2009 paper published in the Annals of Pharmacotherapy suggested that cocaine itself may produce the pathology that seems to be associated with levamisole.
- ▶ While there have been anecdotal reports that the 70% number reported in 2009 by SAMHSA is lower today, there is nothing definitive in the literature stating the amount of cocaine laced with levamisole is either higher or lower than what was reported in 2009.

Alcopops and Alcohol Energy Drinks

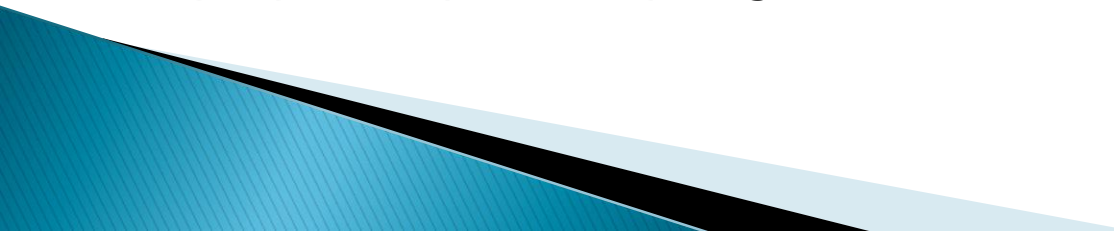


Alcopops

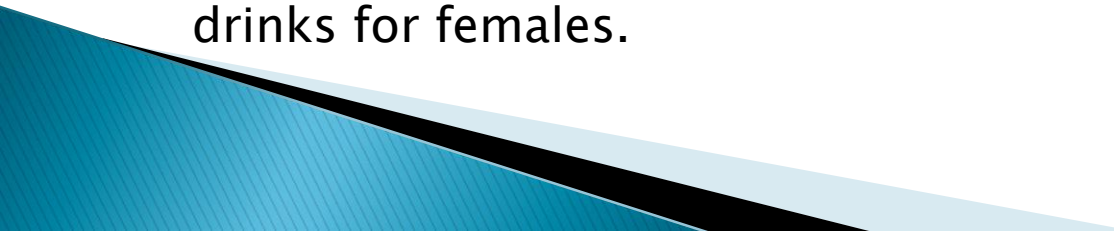
Alcopops and Alcohol Energy Drinks

- ▶ Alcopops are sweetened alcoholic beverages that are bubbly and fruit flavored. They are made to taste like soda, lemonade, punch and have 4–8% alcohol by volume.
 - ▶ They comprise over 100 brands, with the popular ones being Smirnoff Ice, Jack Daniel's Original Hard Cola, Captain Morgan Gold, and Mike's Hard Lemonade.
 - ▶ They are marketed to bring in new drinkers who don't like the taste of beer and who haven't matured to bourbon, vodka or other hard liquors.
 - ▶ While outlawed, they have come back with less caffeine. This is usually something that can be worked around by adding some redbull, or making your own Vodka and Redbull mixture.
- 

Alcopops and Alcohol Energy Drinks

- ▶ These drinks are marketed at the young population.
 - ▶ Alcohol marketers state they are aiming at the 21–30 year old crowd when marketing these drinks. However marketing research has shown that the 12–20 year old population drink twice the amount of alcopops that the 21–30 year old market does.
 - ▶ In 2005, NJ estimates were that 17.3% of total sales/consumption of alcopops were consumed by underage drinkers.
 - ▶ Alcohol Energy drinks are marketed at the same population, promoting “energy” while getting one drunk. The main ingredients are alcohol and caffeine. However, they are marketed with purportedly “healthy” ingredients such as Ginseng.
- 

Alcohol Energy Drinks – 2010 Study

- ▶ Those who drink caffeinated alcoholic beverages are twice as likely as other drinkers to binge drink and act out with dangerous behavior, according to a recent study by Loma Linda researchers.
 - ▶ Drinks that have risen in popularity, such as Four Loko, lead to binge drinking and pose greater health risks when alcohol and caffeine are put together in large doses.
 - ▶ The university commissioned a survey of 1.4 million Californians that showed 25 percent of men and 10 percent of women admitted to binge drinking. When caffeinated alcohol drinks are added, users are twice as likely to binge drink, drive drunk, be injured or be sexually taken advantage of.
 - ▶ Binge drinking is defined as 5 drinks at one setting for males and 4 drinks for females.
- 

Alcohol listed as most dangerous drug

- ▶ Alcohol ranks "most harmful" among a list of 20 drugs, beating out crack and heroin when assessed for its potential harm to the individual imbibing and harm to others, according to study results released by a British medical journal.
- ▶ Overall, alcohol was the most harmful drug (overall harm score 72), with heroin (55) and crack cocaine (54) in second and third places.
- ▶ Scissors is a new mixture of codeine (sometimes substituted with Nyquil or DXM over the counter cough medicine), promethazine, Vodka, and Sprite.
- ▶ Sometimes put a Jolly Rancher in it for color. There are probably 20+ rap songs that reference it in the past few years.

Alcohol consumption myths and facts

- ▶ Vodka soaked **gummy bears**. Yes soaking gummy anything in vodka is the latest emerging trend. – **Alcohol consumption media stoked fact:**
- ▶ Drug and alcohol counselors worry liquor-soaked gummy candy could make it more appealing for teenagers to take their first taste of alcohol.
- ▶ **Vodka-soaked tampons and butt chugging** – **Alcohol consumption media stoked myth:**
- ▶ It gets absorbed directly into the bloodstream
There's no barrier, there's no stomach acid to prevent it.
- ▶ Boys will also use it and they'll insert it into their rectums.



Emerging Drugs of Abuse Hallucinogens and Beyond

Glenn Duncan LPC, LCADC, CCS, ACS

Presentation Last Updated 28-Aug-12

Bromo-DragonFLY (Bromo-benzodifuranyl-isopropylamine)

- ▶ Bromo-DragonFLY is a psychedelic hallucinogenic drug related to the phenethylamine family. Bromo-DragonFLY is considered an extremely potent hallucinogen, only slightly less potent than LSD with a normal dose in the region of 200 µg to 800 µg, and it has an extremely long duration of action up to **several days**.
- ▶ Although not illegal in the US, although it may be considered a controlled substance analogue under US drug laws, if used for consumption.
- ▶ A Swedish man had to have the front part of his feet and several fingers on one hand amputated after taking a massive overdose.
- ▶ Apparently the compound acted as a long-acting efficacious vasoconstrictor, leading to necrosis and gangrene which was delayed by several weeks after the overdose occurred.
- ▶ Several other cases have also been reported of severe peripheral vasoconstriction following overdose with Bromo-DragonFLY.

Bromo-DragonFLY (Bromo-benzodifuranyl-isopropylamine)

- ▶ One case in 2008 in England involved inhalation of vomit, causing nearly fatal asphyxia.
- ▶ Seizures have also been reported as potential effects of the drug.
- ▶ The typical dose of Bromo-DragonFLY is not known, however it has varied from 500 µg to 1 mg. It has about 300 times the potency of mescaline, or 1 / 5 the potency of LSD. It has been sold in the form of blotters, similar to the distribution method of LSD.
- ▶ It has a much longer duration of action than LSD and **can last for up to 2-3 days**. following a single large dose, with a slow onset of action that can take up to **6 hours before the effects are felt**.

2C-E – (2,5-dimethoxy-4-ethylphenethylamine)

- ▶ 2C-E is a psychedelic and phenethylamine (some of which are psychoactive drugs, including stimulants, psychedelics, opioids, and entactogens), of the 2C family.
- ▶ The 2C's have been compared to a combination of a tryptamine with MDMA due to their tendency to cause visual hallucinations in tandem with warm rushes of euphoria, but this is only a very rough comparison. They have been classified as empathogens and entactogens to some degree.

The initial come up can be somewhat lucid, "loopy", with alternating feelings of chills and warmth.

- ▶ There can be a sense of pressure or swelling in the torso and head. The hands and body can shake or tremble, there can occur a tightness in the jaw. The body buzz tends to resolve during the latter half of the trip, and the psychological effects can be more pronounced.
- ▶ They are a dose dependent drug (meaning different doses cause different effects).

FDA Safety and Innovation Act

- **SEC. 1152. ADDITION OF SYNTHETIC DRUGS TO SCHEDULE I OF THE CONTROLLED SUBSTANCES ACT.** (Adding an additional 11 drugs to Schedule 1)
 - ▶ *(b) Other Drugs– Schedule I of section 202(c) of the Controlled Substances Act (21 U.S.C. 812(c)) is amended in subsection (c) by adding at the end the following:*
 - ▶ *‘(18) 4-methylmethcathinone (**Mephedrone**).*
 - ▶ *‘(19) 3,4-methylenedioxypyrovalerone (**MDPV**).*
 - ▶ *‘(20) 2-(2,5-Dimethoxy-4-ethylphenyl)ethanamine (**2C-E**).*
 - ▶ *‘(21) 2-(2,5-Dimethoxy-4-methylphenyl)ethanamine (**2C-D**).*
 - ▶ *‘(22) 2-(4-Chloro-2,5-dimethoxyphenyl)ethanamine (**2C-C**).*
 - ▶ *‘(23) 2-(4-Iodo-2,5-dimethoxyphenyl)ethanamine (**2C-I**).*
 - ▶ *‘(24) 2-[4-(Ethylthio)-2,5-dimethoxyphenyl]ethanamine (**2C-T-2**).*
 - ▶ *‘(25) 2-[4-(Isopropylthio)-2,5-dimethoxyphenyl]ethanamine (**2C-T-4**).*
 - ▶ *‘(26) 2-(2,5-Dimethoxyphenyl)ethanamine (**2C-H**).*
 - ▶ *‘(27) 2-(2,5-Dimethoxy-4-nitro-phenyl)ethanamine (**2C-N**).*
 - ▶ *‘(28) 2-(2,5-Dimethoxy-4-(n)-propylphenyl)ethanamine (**2C-P**).’.*

Kratom



Kratom

- ▶ Kratom is a medicinal leaf harvested from large trees, commonly known as kratom trees.
- ▶ The kratom tree grows best in wet, humid, fertile soil, with medium to full sun exposure, and an area protected from strong winds (usually grown and used in places such as Malaysia, Thailand, and Indonesia).
- ▶ Kratom's primary pharmacology is mediated by the alkaloids 7-hydroxymitragynine and mitragynine.
- ▶ **Alkaloids** are a group of naturally occurring chemical compounds and are produced by a large variety of organisms, including bacteria, fungi, plants, and animals.
- ▶ Examples of famous alkaloids are the local anesthetic and stimulant **cocaine**; the stimulant **caffeine**; **nicotine**; the analgesic **morphine** (an alkaloid first extracted from the poppy plant in 1804 by Friedrich Sertürner, first distributed by Friedrich in 1817, and first commercially sold by Merck in 1827).


Kratom – Effects

- ▶ The common belief is Kratom acts as a stimulant in lower doses, becoming sedative in higher doses.
- ▶ The alkaloid **mitragynine** is attributed to act as a stimulant. Though some research has shown that mitragynine, the major alkaloid identified from Kratom, has been reported as a partial opioid agonist producing similar effects to morphine.
- ▶ The alkaloid **7-hydroxymitragynine** (still believed to be a minor alkaloid involved in Kratom, though more recent research shows it to be the major contributor to the opioid type high) is the most significant alkaloid for sedation with more potent analgesic activity than that of morphine.
- ▶ Effects come on within five to ten minutes after use, and last for several hours. The feeling has been described as happy, strong, and active, with a strong desire to do work. The mind is described as calm.
- ▶ Kratom itself is believed to be similarly addictive if abused.


Kratom – Effects

- ▶ Ceiling effect: limits respiratory depression and euphoria.
- ▶ No fatal overdose of kratom known to have occurred, at least in reported literature.
- ▶ Short-term (immediate)
 - Dry mouth
 - Increased or decreased urination
 - loss of appetite
 - Nausea and/or vomiting.
- ▶ Side effects (Intermediate)
 - Anorexia/weight loss
 - Insomnia
 - Dependence (addiction). This is postulated, there is no research on the addictive components of Kratom. Some argue that only large, repeated daily use has the potential for addiction, and recreational use does not.

Kratom – Legal Issues

- ▶ Daily kratom users can develop a dependency similar to that of opiate addiction; however, withdrawals from kratom are said to be substantially less severe and shorter in duration. If used sporadically, kratom dependency is believed to be remote.
 - ▶ Kratom is a controlled substance in Thailand, Bhutan, Australia, Finland, Denmark, Poland, Lithuania and Sweden as of September, 1, 2011.
 - ▶ Kratom is also illegal in Malaysia and Myanmar (Burma). In Malaysia, kratom is scheduled under the Poisons Act.
 - ▶ In Canada, although kratom has not been approved by Health Canada for human consumption, it currently does not fall under the purview of the Controlled Drugs and Substances Act thus, remaining largely unregulated.
 - ▶ Kratom is currently **unregulated** in the United States and hasn't appeared on DEA's radar.
- 

Potentials on the Horizon – Krokodil

- ▶ *Krokodil* has roughly the same effect as heroin but is at least three times cheaper and extremely easy to make.
 - ▶ The active component is codeine, a widely sold over-the-counter painkiller that is not toxic on its own.
 - ▶ But to produce *krokodil*, whose medical name is desomorphine, addicts mix it with ingredients including gasoline, paint thinner, hydrochloric acid, iodine and red phosphorous, which they scrape from the striking pads on matchboxes.
 - ▶ In 2010, between a few hundred thousand and a million people, according to various official estimates, were injecting the resulting substance into their veins in Russia, so far the only country in the world to see the drug grow into an epidemic.
- 

Potentials on the Horizon – Oxi

- ▶ Derived from cocaine, **oxi** (short for **oxidado** or “rust”) may also contain kerosene or gasoline as well as acetone, battery acid or assorted other chemicals. The drug is smoked and has a nearly instantaneous effect.
- ▶ The pleasure of this drug is at this very moment. When you inhale, it's the first five seconds that is the ecstasy of this drug, when it comes to your brain. You feel your ear making a buzzing sound. You forget everything.
- ▶ The effects of oxi on users are devastating. Users take on a yellowish skin color, lose weight very quickly and develop liver problems. They start to look like emaciated living corpses in just a few weeks time. The drug causes stomach aches, vomiting and constant diarrhea, but perhaps the most alarming fact is that most users die within a year.
- ▶ Use of oxi has exploded in Brazil since 2005. Oxi has already gripped most of Brazil's seven northern states that make up the Amazon region, and in recent months it has been seen in large population centers in the south of Brazil.

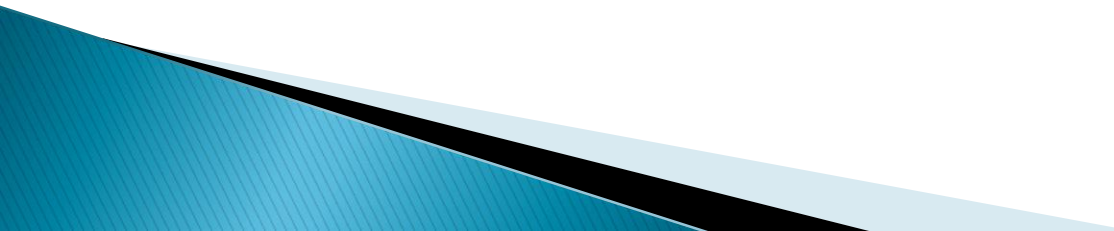
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Additional Information About This Presentation

- ▶ A comprehensive article on synthetic cathinones (“bath salts”) is available at: <http://www.hdap.org/mdpv.html>
- ▶ A comprehensive article on synthetic cannabinoids (“spice/k2”) is available at: <http://www.hdap.org/spice.html>.
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